

PROJECT TITLE : BIOTECHNOLOGY
PERIOD COVERED : AUGUST 1 - 31, 1980
WRITTEN BY : J. BERNEY

1. DENITRATION, STEM-EXTRACT, ACETIC ACID (1)

When acetic acid is used for pH adjustment in the NINO process, the following acid consumption values are observed:

<u>Denitration pH</u>	<u>acetic acid consumption</u>
	g/l
5.0	36.26
5.5	32.74
6.0	37.77
6.5	36.89

As can be seen from the table, the acetic acid consumption is fairly independent of the pH value at which the denitration process took place. However, from a pH of 4.5 downwards problems were encountered with nitrate assimilation by the yeast. That means that for all practical purposes pH 5 is the lowest possible pH for denitration with *Candida utilis* and acetic acid for pH control.

The residual acetic acid concentration in the denitrated extract is going to be determined and will be reported shortly.

2. NITRATE MEASUREMENTS WITH THE TECHNICON MONITOR (2)

The suitability of the Technicon IV nitrate monitor for continuous measurements of nitrate values in SEL has been tested. In four separate experiments, continuous measurements covering periods between 15 and 18 hours showed the following variation:

<u>No. of Run</u>	<u>Nitrate Measurements</u>	
	<u>Coefficient of Variation</u>	
1	3.2	
2	9.5	
3	2.4	
4	2.5	

The results shown in the table are comparable with those obtained with the ORION NO₃ electrode (3).

As with the ion-specific electrode, there are fouling problems with the Technicon. These problems could be overcome by using rinsing cycles between the measurements.

It appears that the Technicon system is a valuable alternative to the ORION electrode as sensor in an electronic control system.

3. CONTROL OF SUGAR ADDITION IN PROPORTION TO THE NITRATE CONCENTRATION

In order to assure maximum efficacy of the NINO process, the sugar concentration of the incoming SEL has got to be adjusted in proportion to its nitrate content.

In order to do so Mr. Thevoz, in collaboration with the Biotechnology Group, designed a suitable electronic control system. The equipment would be tested in the laboratory before its installation in the NINO pilot plant.

The first parts of the required hardware have already been ordered. It is foreseen to proceed in two steps: first to automate the determination system, and then to proceed with the automatic feedback regulation of the sugar addition.

4. MISCELLANEOUS

Services to other groups:

- Freeze-drying of NINOMass (PAG).
- Determination of citrate (4) (LIJ).
- Determination of Total-N (pilot plant).

REFERENCES

- (1) M. Mangilli, Laboratory Notebook 791205, p.45-49.
- (2) J. Berney, Laboratory Notebook 791202, p. 24-32.
- (3) D. Schulthess, Monthly Report Biotechnology, March 1980
- (4) J. Berney, Laboratory Notebook 791202, p. 34-36

J. Berney